

STAFF REPORT FOR REGULAR MEETING OF APRIL 19, 2002

Draft Prepared on March 19, 2002

ITEM: 10

SUBJECT: Reissuance of Waste Discharge Requirements, National Pollutant Discharge Elimination System Permit No. CA0048160, for Goleta Sanitary District's Wastewater Treatment Plant, Santa Barbara County--Order No. RB3-2002-0021

KEY INFORMATION

Location:	Goleta, unincorporated area of Santa Barbara County
Waste Type:	Municipal wastewater (domestic, commercial, light industrial)
Total Design Capacity:	9.0 million gallons per day (MGD; average dry weather flow)
Secondary Treatment	
Design Capacity:	Up to 4.4 MGD
Present Flow:	Approximately 4.7 MGD (2000 annual monthly average)
Treatment:	Split-stream process consisting of preliminary treatment, primary settling and secondary treatment (trickling filter/solids contact), with chlorination/dechlorination of blended primary and secondary effluent.
Disposal:	Discharge to the Pacific Ocean through an 1,802 m (5,912 ft) outfall/diffuser system
Existing Orders/Permit:	Order No. 96-21, NPDES Permit No. CA0048160

SUMMARY

On January 23, 2001, the Goleta Sanitary District (Discharger) applied to the U.S. Environmental Protection Agency, Region IX (EPA) and the Regional Board to continue to discharge treated wastewater subject to a variance from secondary treatment standards. The Discharger applied for the variance in accordance with the Clean Water Act's (Act) Section 301(h). On January 17, 2002 EPA issued a Tentative Decision Document (TDD) granting the variance. In accordance with this decision and the authority vested in EPA by the Act's section 402, the Regional Administrator is proposing to issue a draft modified National Pollutant Discharge Elimination System (NPDES) permit regulating the discharge. The proposed permit incorporates the tentative decision.

The TDD is incorporated herein by reference as part of this staff report. This staff report and the TDD set forth the principal facts and significant legal, methodological, and policy questions considered in the development of the draft permit. The draft permit is

based on the administrative record available for public review at the offices of USEPA and the Regional Board.

The Discharger remains in compliance with all discharge and receiving water limitations, including solids and bacteria, as demonstrated by the results of many effluent, receiving water, and seafloor monitoring events. The discharge has contained an average solids concentration of 39 mg/L, well below the limit of 63 mg/L and 9 mg/L more than the secondary standard. Effluent total coliform averaged 57 MPN/100 mL over the past five years, compared to the 30 day average limit of 2,400 MPN/100 mL. Receiving water monitoring has continually found less than two MPN/100 mL in each ocean sample. Annual evaluation of the seafloor near the point of discharge has found a healthy ecosystem. As discussed in Attachment 1 to this report, this Board's effluent monitoring validates the results of the Discharger's self-monitoring program. The discharge has complied

with all other Water Quality Control Plan for Ocean Waters of California (Ocean Plan) requirements.

Based on these findings, the US EPA TDD concluded that the discharge is not impairing the ocean's uses nor populations of marine life. In addition, the TDD concludes that data obtained since 1985, in accordance with Monitoring and Reporting Programs (MRPs) demonstrate the discharge has not threatened, and is not now threatening, to impair the Pacific Ocean's beneficial uses. Therefore, proposed Order No. RB3-2002-0021 and MRP No. RB3-2002-0021 specify the same effluent and receiving water limitations (RWLs), and monitoring and reporting requirements, included in Order and MRP Nos. 96-21.

BACKGROUND

Introduction

In order to meet the stringent requirements of section 301(h) of the Act, the Discharger must demonstrate the wastewater does not impair the ocean's beneficial uses, as specified in this Region's Water Quality Control Plan (Basin Plan). Some of these beneficial uses include marine habitat, shellfishing, and body-contact recreation. Receiving water monitoring must indicate the existence of a balanced population of representative organisms, thereby demonstrating protection of the marine habitat beneficial use. Also, receiving water monitoring must not detect elevated bacterial concentrations in the ocean to demonstrate protection of shellfishing and recreational beneficial uses.

The Discharger treats the wastewater to a substantially higher standard than "primary or equivalent" as required by section 301(h) of the Act. Pursuant to the Act, the Discharger monitors representative samples of organisms living within, on, and near the seafloor for changes caused by the discharge. By means of its pretreatment program, the Discharger seeks to ensure toxic wastes are removed, commercial and industrial sources prior to being discharged into the collection system. To minimize overflows and inflow and infiltration, the Discharger conducts an ongoing collection system maintenance and renovation program.

In its NPDES application, the Discharger evaluated potential factors contributing to the effect the discharge may have on the ocean's beneficial uses over the next five years (the permit cycle) and over the longer term. These factors include:

- Projected population growth, and associated water use and wastewater generation rates;
- Direction and frequency of currents near the point of discharge, and their effects on wastewater transport; and
- Projected solids discharge rates, their rate of deposition on the seafloor, and the oxygen depletion caused by solids deposition.

This staff report describes and analyzes the following:

- EPA and Board authority to approve a waiver from secondary standards;
- The administrative process;
- Projected population, flow, and wastewater characteristics;
- Initial dilution, solids deposition, and oxygen depletion modeling of the discharge; and
- The Discharger's monitoring programs, including effluent and receiving water programs, and their results.

Authority

Section 402 of the Act gives EPA the authority to issue NPDES permits for wastewater discharges to navigable waters and to prescribe conditions for such permits necessary to carry out the Act's provisions. Section 301(b)(1)(B) of the Act requires publicly owned treatment works (POTWs) to meet effluent limitations (ELs) based on secondary treatment as defined by the EPA Administrator. The Administrator has defined secondary treatment in terms of three parameters: biochemical oxygen demand (BOD₅), total suspended solids (TSS), and pH.

On December 27, 1977, Congress amended the Act to include section 301(h), which provides that an NPDES permit which modifies federal secondary treatment requirements may be issued if the applicant: 1) discharges into oceanic or saline, well-mixed estuarine waters, and 2) demonstrates, to the satisfaction of the Administrator, that the modifications will meet those requirements specified in section 301(h). Modified Waste Discharge Requirements Order No. 96-21 and NPDES Permit No. CA0048160, waiving secondary treatment requirements, was issued to the Discharger on July 26, 1996. This permit expired on July 26, 2001. The Discharger applied for reissuance of its 301(h) variance on March 29, 2001. Section 303 of the Water

Quality Act of 1987 amended section 301(h); the Discharger's application for reissuance was reviewed under the criteria specified by the 1987 amendments.

The State of California administers an approved NPDES permit program, and issues orders for discharges to waters within State jurisdiction. Authority to grant a variance and issue a modified NPDES permit under section 301(h) of the Act is, however, limited to EPA's Regional Administrator. State concurrence on the issuance of a modified permit is required by section 301(h) of the Act. The Regional Board will consider issuance of waste discharge requirements for the Goleta treatment plant under the authority of the California Water Code. If the Board adopts the proposed waste discharge requirements, this will constitute concurrence by the State regarding the issuance of a 301(h) modified NPDES permit (in accordance with the Memorandum of Understanding between the State of California and EPA, Region IX regarding 301(h) variances, dated May 2, 1984).

The Act's section 301(h) conditionally waives the requirement for municipal wastewater treatment plants to comply with secondary standards before discharging wastewater to the ocean. Secondary standards may be waived for biochemical oxygen demand (BOD), total suspended solids (TSS), and pH. In accordance with federal regulations (40 CFR 125.57), as a condition of the waiver, the discharge must not interfere with the attainment or maintenance of that water quality which assures the protection and propagation of a balanced, indigenous population of fish, shellfish and other wildlife. To demonstrate a balanced population is present, the Discharger must monitor a representative sample of indigenous organisms. In addition, the Discharger must establish and enforce a pretreatment program to control industrial wastes and toxic wastes from industrial and nonindustrial sources.

The 301(h) waiver requires the Discharger to provide at least primary or equivalent treatment to the wastewater before discharging it to the Pacific Ocean. That is, the Discharger must remove from the influent stream, as a 30-day average, at least 30% of the BOD and 75% of the TSS before discharging the treated wastewater to the Pacific Ocean. Goleta Sanitary District's discharge substantially exceeds these treatment levels. For 2001 BOD removal averaged 74 %; TSS removal averaged 85 %.

Administrative Process

The administrative processing of a section 301(h) variance application consists of the following actions:

1. Filing a timely and complete application;

2. Initial screening of the application by the State of California;
3. Comparison of the application with criteria set forth in the statute and regulations, from which the Technical Review Report (TRR) is prepared;
4. Preparation of a recommendation and TDD for the EPA Regional Administrator by the 301(h) review staff;
5. Announcement of the tentative decision by the Regional Administrator;
6. Issuance of notice of a draft NPDES permit with modifications, or notice to deny the application, by the Regional Administrator;
7. Conduct public hearings where necessary to address public interest;
8. State concurrence in the granting of a 301(h) variance through State and EPA joint issuance of a modified NPDES permit;
9. Issuance of a section 301(h) modified NPDES permit, or issuance of application denial by the Regional Administrator;
10. Processing of appeals, in accordance with procedures defined in 40 CFR 124 Subpart E.

Wastewater treatment plant. The Discharger owns and operates the Goleta municipal wastewater treatment plant. The plant's primary treatment design capacity is 9.0 MGD (average dry weather flow) and 9.7 MGD (peak seasonal dry weather flow); secondary treatment design capacity is 4.4 MGD (constant flow). The Goleta plant uses a split-stream process of physical and biological treatment. All wastewater flows through primary clarifiers. All wastewater up to 4.4 MGD then flows through secondary treatment facilities, including biofiltration, solids-contact, and secondary clarification. Flow greater than 4.4 MGD passes through primary only and is then blended with secondary-treated wastewater. The wastewater is then disinfected by chlorination/dechlorination prior to ocean discharge. Biosolids are anaerobically digested, and stored in stabilization basins, air-dried, and used to condition soils.

Waste discharge requirements. The existing and proposed Orders govern the discharge's quality by means of effluent and receiving water limitations. The limitations are based on federal regulations and the

December 2001 *Water Quality Control Plan for Ocean Waters of California* (Ocean Plan). Based on the Act's section 301(h), the Order specifies effluent limits (ELs) for BOD and TSS. ELs found in Table 2.a of Order No. 2002-0021 are based on the Ocean Plan's Table A pollutants, which are major wastewater constituents and properties, including grease-and-oil, settleable solids, turbidity, pH, and acute toxicity. Table 2.b of the proposed order specifies limits for the Table B pollutants, which are metals and organic compounds toxic to aquatic life and hazardous to human health. To ensure the discharge undergoes maximum disinfection, at least five mg/L of total chlorine residual is required at the end of the chlorine contact chamber. As a secondary control on the bacteria discharged to the ocean, the discharge may contain no more than 2,400 Most Probable Number (MPN)/100 milliliters (mL) (EL 2.d).

To protect the shellfishing and body-contact recreation beneficial uses, the proposed Order also specifies Receiving Water Limitations for total and fecal coliform bacteria.

Proposed Order No. 02-0021 requires the Discharger to continue to monitor the effluent and receiving water at the locations and frequencies specified in the existing Order No. 96-21. Staff routinely conducts annual random, unannounced sampling inspections to validate the results of the Discharger's self-monitoring. Analytical results of staff sampling event indicate compliance with effluent limits.

301(h) waiver from secondary standards. Many species of bacteria feed on organic material, such as human body wastes. To break down the wastes, bacteria must extract oxygen from the surroundings: the creeks, rivers, and the oceans in which they live. Bacteria use much more oxygen to break down untreated or partially treated wastewater than wastewater from which most solids and dissolved organic compounds have been removed. Discharges of partially treated wastewater to creeks and rivers can quickly deplete the limited supplies of oxygen normally present (usually less than seven mg/L), and thereby eliminate the ability of these waters to support aquatic life.

In the 1960's, federal law required cities and states to remove solids from municipal wastewater before discharging the wastewater to surface waters. However, municipalities continued to discharge high levels of dissolved organic material. Bacterial action on the dissolved compounds often removed most of the oxygen from the waters receiving the discharge. With

no dissolved oxygen remaining, many creeks, rivers and ocean areas were rendered uninhabitable for aquatic life for great distances from the point of discharge.

Based on this and other factors, in 1972 Congress passed the Clean Water Act, which required Publicly Owned Treatment Works (POTWs) to treat their wastewater discharges to secondary standards. To achieve secondary treatment, bacteria held in reactor tanks break down most of the dissolved organics remaining after primary solids settling. Wastewater treated to secondary standards usually does not cause significant effects in the receiving water. Wastewater treated to secondary standards contains, on average, less than 30 mg/L of BOD and 30 mg/L of Total Suspended Solids (TSS). The Goleta POTW currently discharges an average of 57 mg/L BOD and 42 mg/L TSS.

After the Act's passage, some municipalities with POTWs that discharge into marine waters argued that requiring treatment to secondary standards is excessive and unnecessary because the oceans possess a substantially greater capacity than creeks and rivers to assimilate wastewater discharges. The main contributing factors to the greater capacity are that marine POTWs usually discharge into deeper waters, subject to tidal action and substantial currents, which provide greater dilution and dispersion than their freshwater counterparts. Based on these findings, Congress added section 301(h) to the Act in 1977, which allows for a case-by-case review of treatment requirements in accordance with a set of environmentally stringent criteria. Section 301(h) allows waiving secondary treatment requirements for BOD, TSS and pH, conditioned on the Discharger's monitoring the ocean for adverse effects on wildlife populations and other factors discussed above.

DISCUSSION OF THE DISCHARGE'S EFFECT ON MARINE HABITAT

CURRENT AND FUTURE WASTEWATER CHARACTERISTICS.

Introduction. Accurate projections of future wastewater flowrates and characteristics are necessary to estimate the generation rate of wastewater constituents at the completion of the permit cycle. This staff report evaluates projections to the year 2007 as provided by the Discharger in the application. The projections are also necessary to determine the limiting seawater-to-effluent initial dilution ratio, to ensure the Discharger provides the level of treatment necessary to

comply with effluent limits based on the Ocean Plan's water quality objectives.

Current wastewater discharge flow and characteristics. The Goleta plant currently provides partial secondary treatment for an annual monthly average flow of 4.7 MGD (2000), up from 4.5 MGD in 1992. 4.4 MGD receive secondary treatment while 0.3 MGD, on average, receive primary treatment only. Annual average effluent concentrations are 62 mg/L for BOD (2000), up from 43 mg/L in 1994 and 39 mg/L for TSS (2000), up from 32 mg/L in 1994. The proposed ELs for BOD₅ and SS are based on Goleta plant design specifications for combined primary and secondary effluent quality under peak seasonal dry weather flow loading conditions. Mass emissions rate limitations are calculated using the design annual average dry weather flowrate of 9.0 MGD. The ELs are:

Maximum	Units	Monthly	
		Average	at any time
BODs	mg/L	98	150
	lbs/day	7,360	11,265
SS	mg/L	63	100
	lbs/day	4,730	7,510

Projected wastewater flow and characteristics. To achieve the most accurate estimate possible, projections of future wastewater flowrates must be based on well-founded projections of increases in population. The Discharger based its population projections on the University of California at Santa Barbara (UCSB) Economic Forecast Project. The project collects and verifies data on economic trends in the Goleta area. The data allow the projection of population growth, which is estimated at 1.4 percent per year for the next few years. Hence, the future contribution of wastewater from private residences can be estimated by increasing the current flow by 1.4 percent per year to yield 6.9 MGD.

In 1998, the Discharger commissioned Dudek and Associates to project the District's future wastewater generation rates. Based on detailed land use information developed from local records, Dudek projected future uses of undeveloped parcels in the District. Local planning documents guided the projections, which estimate an increase in flow of 0.84 MGD over the next five years from commercial and industrial growth. Additionally, the Discharger estimated an additional increase in flow of two percent over the next five years due to increases in commuter

population and potential land use and zoning changes. Summing these estimates yields a 2007 flowrate to the plant of 8.24 MGD.

As discussed below, the plant can generate up to 3.3 MGD of recycled wastewater from the secondary-treated effluent. In 1999, the Discharger completed projections of future recycled water demand, based on existing contracts for recycled water. Average annual demand in 2007 is projected at 1.12 MGD, which results in an effluent discharge rate of 7.12 MGD. Demand during the maximum demand month in 2007 is projected to be 2.49 MGD, resulting in an effluent discharge rate to the Ocean of 5.21 MGD.

In accordance with the procedures discussed in the following section, the Discharger modeled the initial dilution ratio at a range of projected effluent flowrates. 9.0 MGD, the plant's design flowrate, generated the lowest seawater-to-effluent dilution ratio of 111:1, resulting in the lowest (most conservative) ELs.

The following table provides the discharge's BOD and TSS projected to 2007, the end of the five-year permit cycle.

Table 1

Projected Discharge Parameters

Effluent flow, MGD	BOD, mg/L	TSS, mg/L	TSS, mg/L ⁶
5.21 ¹	93 ⁴	67 ⁴	
7.12 ²	82 ⁵	59 ⁵	49 ⁶
9.0 ³	89 ⁵	64 ⁵	

1. Effluent flowrate projected during the month of maximum recycled water demand in 2007.
2. Average annual effluent flowrate discharged at the average recycled water demand projected for 2007.
3. Plant's design flowrate, average annual dry weather flow.
4. At maximum monthly recycled water demand.
5. Average annual flowrate.
6. With additional advanced primary treatment.

At 67 mg/L, Table 1's TSS effluent concentrations projected for 2007 summer periods of maximum recycled water demand would exceed the EL of 63 mg/L. The Discharger has achieved reduced effluent TSS concentrations by adding ferric chloride and other polymers, projecting effluent TSS at 49 mg/L during summer periods of maximum reclaimed water demand.

The proposed Order's Provision H.11 allows the Discharger 180 days to report its experimental results and projections to the Board.

Initial seawater-to-effluent dilution ratio. To protect the ocean's beneficial uses, the proposed Order requires the Discharger to ensure that the discharge complies with water quality standards specified in the Ocean Plan. To achieve this goal, the Discharger treats the wastewater to reduce pollutants to concentrations less than the Ocean Plan's limits, specified outside a "zone of initial dilution" (dilution zone). The initial dilution zone is the region adjacent to the diffuser in which the wastewater, due to its greater buoyancy and velocity relative to the surrounding ocean waters, mixes rapidly with the ocean waters. Computer models developed by EPA estimate the seawater-to-effluent dilution ratio achieved during the initial mixing phase in the dilution zone. The minimum initial dilution ratio (dilution ratio) achieved at the dilution zone's boundary determines the maximum pollutant concentrations allowed in the wastewater before its discharge to the ocean.

In the summer months, at the 'thermocline', a sharp increase in seawater temperature and decrease in density often occur at a point in the water column. The thermocline traps the wastewater beneath it, because the wastewater is more dense than the layer above, although less dense than the layer below. The wastewater plume rises to the bottom of the upper layer, into which it cannot move. In comparison to when no thermocline is present, substantially less mixing occurs, and a lower initial dilution ratio is achieved. Therefore, the Discharger conducted all modeling based on water column data obtained from the ocean near the discharge during July, when the thermocline was found to be most severe, the usual case. The lowest, most conservative dilution ratio subsequently results from the modeling.

In this case, the wastewater discharges at a relatively high velocity from 36 outfall ports approximately 80 feet below the surface. Based on the results of the computer modeling, the proposed Order and Permit use a seawater-to-effluent dilution ratio of 111:1 to determine limits for the Ocean Plan's Table B constituents in the discharge before it is discharged. Approximately 80 in number, the constituents include toxic metals, ammonia, and chlorine residual, toxic, carcinogenic and noncarcinogenic synthetic organic compounds, and chronic toxicity.

MODELING THE EFFECT ON AQUATIC LIFE OF SOLIDS DISCHARGED FROM THE PLANT.

Introduction. As the population in the Discharger's service area increases, the volume of wastewater entering the plant and the demand for recycled wastewater also increase. As described below, these trends combine to result in the plant discharging increasing quantities of solids in greater concentrations, which could degrade water quality on and near the ocean floor. Degraded water quality may adversely affect habitat and populations of marine organisms, and thereby impair, or threaten to impair, the marine habitat, shellfishing, and commercial and sports fishing beneficial uses.

To evaluate if solids discharged from the plant to the Ocean cause adverse effects on aquatic life, the Discharger used the following procedure:

- Estimate the initial seawater to effluent dilution ratio and other factors needed to calculate the solids likely deposited in the vicinity of the point of discharge; employing conservative modeling procedures,
- Compute the estimated solids deposition rate, and
- Estimate the oxygen depletion caused by the solids deposited on the seafloor.

Water Recycling

The treatment plant includes tertiary wastewater treatment processes, which generate recycled water. The Goleta Water District distributes the recycled water throughout the Goleta area, where it is used to irrigate landscapes at golf courses, schoolyards, public parks, and other public areas. The plant can reclaim up to 3.3 MGD, although the community currently uses only 0.7 MGD.

As demand for the recycled water increases, the quantity of secondary-treated wastewater available to be blended with the primary effluent decreases. (See Background section of this Staff Report for a more detailed description of the treatment plant.) The concentration of solids in the blended discharge to the Ocean therefore increases due to increased fraction of primary effluent, which contains a higher solids concentration than the secondary-treated wastewater. However, for the same influent flowrate, the total solids discharged (pounds per day) decreases with increased reclaimed water demand because less wastewater is discharged.

Staff estimates the total solids discharged to the Ocean is more likely to cause adverse effects, if any, rather than the concentration of solids. As discussed above,

the outfall diffuser system dilutes the discharge with seawater at a seawater-to-effluent dilution ratio of 111:1. Therefore, if the plant discharges solids at the current EL of 63 mg/L, the concentration at the boundary of the zone of initial dilution would equal approximately 0.6 mg/L. Solids are thus reduced to essentially background concentrations at the boundary, which is approximately 10 meters from the point of discharge.

The plant will discharge the greatest quantity of solids at its design flow rate of 9.0 MGD, average dry weather flow. Therefore, the Discharger modeled the sediment deposited at 9.0 MGD, employing two complementary EPA methods. EPA's *Amended Section 301(h) Technical Support Document* (TSD) describes the first method, which estimates the quantity of solids continually present on the seafloor due to the solids in the discharge. The method considers the natural biodegradation of the solids, but does not estimate their resuspension by current forces or masking by natural sedimentation. (Long-term water sampling near the seafloor for transmittance often shows turbidity near the seafloor at all stations, probably due to the resuspension of sediments.) Therefore, most agree the model is conservative, overestimating the quantity of solids present on the seafloor due to the discharge. The model predicts the discharged solids will cause a constant 35 grams per square meter (g/sq. m) to be present continually on the seafloor near the discharge point. Expressed another way, 0.10 ounces per square foot are estimated to be the greatest mass continually present.

The other EPA solids deposition method (SEDDEP) employed by the Discharger estimated a maximum daily deposition rate of approximately 0.4 g/sq. m per day over a deposition area 363 meters wide and 855 meters long due to the discharge. Hence, both estimates predict very low deposition rates.

Sediment oxygen demand. The TSD specifies an approved procedure for estimating the steady-state sediment oxygen demand caused by solids deposition and the oxygen demand caused by the resuspension of the deposited solids. Among other variables, the procedure considers the solids settling rate, the current speed, and the diffusion of oxygen through the water column. The procedure is based on the estimated solids deposition rate discussed above. The estimated steady-state oxygen depletion rate is 0.09 mg/L, and the estimated depletion rate due to resuspension is ranges from 0.07 mg/L to 0.2 mg/L. In contrast, the State Department of Fish and Game's Oceanic Fisheries Investigation conducts quarterly monitoring

for dissolved oxygen concentrations at stations in the vicinity of the discharge. Recent monitoring found oxygen at four to five mg/L at 30 meters depth. Depletion by the small quantities estimated above would slightly reduce the ambient dissolved oxygen. These results are consistent with the estimates of the sediment deposition rates discussed above.

RECEIVING WATER MONITORING

Introduction. The Receiving Water Monitoring Program is designed to ensure compliance with the Order's Receiving Water Limitations, specified in the Section C of the Order. RWL C.14 prohibits the discharge from degrading marine communities, including vertebrate, invertebrate, and plant species. The benthic monitoring component discussed below ensures compliance with other RWLs from the Order.

Monitoring and Reporting Program (MRP) No. RB3-2002-0021 continues essentially the same receiving water monitoring program (program) established in 1985 when the Discharger first began to treat its wastewater and monitor its effects in accordance with the 301(h) waiver. The program is designed to determine if the discharge adversely affects the receiving water, sediments, and/or biota in the vicinity of the discharge. The MRP is designed to verify the results of the solids deposition and oxygen depletion modeling calculations described above. The following discussion describes the program, and the results and data analyses for the sediment, benthic infauna, trawl, and bioaccumulation component of the program's benthic monitoring section.

Program description. The Discharger maintains current meters at 6 and 19-meter depths near the outfall diffuser. Long-term current data demonstrate the current predominantly flows upcoast (from east to west), with few exceptions. Consequently, the program's sampling stations are located assuming the current usually flows upcoast.

The program requires the Discharger to obtain data from nearshore, ocean, plume, and trawl stations. The five nearshore stations monitor the discharge's potential effect on areas known to support kelp. At the offshore edge of the kelp zone, the stations range from 1,200 meters east and 1,200 meters west of the outfall diffuser. These stations typically range along the 60-foot depth contour.

Six ocean stations monitor the water column and benthic biota, with four located down current from the diffuser. The stations range from 25 meters to 1,500 meters west and 25 meters to 3,000 meters east of the

outfall diffuser. All stations are at the depth of the midpoint of the diffuser. To evaluate the discharge's dispersion in the ocean, the program requires quarterly water column monitoring for total and fecal coliform, enterococcus bacteria, grease and oil, and floating particulate matter. At one-meter increments over the entire water column, the program also requires monitoring of parameters that indirectly indicate water pollution, including natural light, dissolved oxygen, pH, salinity, and temperature.

The benthic monitoring program is designed to ensure compliance with the Order's RWLs, specified in Section C, as follows: RWL C.7 prohibits the discharge from changing the deposition rate and characteristics of solids in ocean sediments to the point of degrading benthic communities. RWLs C.11 and C.12 prohibit the discharge from causing the Ocean Plan's Table B pollutants and other organic pollutants to increase in sediment above levels toxic to indigenous biota. To monitor the discharge's effects on marine habitat at the seafloor, the program includes substantial benthic monitoring at the ocean stations, including the following components:

- Annual sediment monitoring at all six ocean stations for persistent and bioaccumulative metals and organic compounds. The data are analyzed statistically to detect trends in sediment concentrations.
- Annual monitoring of benthic infauna (organisms living in the sediment) at all six ocean stations for differences in numbers, diversity, and other parameters between stations.

Benthic monitoring also includes trawl surveys for epibenthic macroinvertebrates (crabs, lobsters, and the like) and demersal fish (flounders, sole, et.al.). The Discharger trawls for samples at two stations: TB3 (in the diffuser area) and TB6 (the control station). The fish are categorized according to species, their numbers evaluated statistically, and their tissues analyzed for bioaccumulative metals and chemical compounds.

Annually, the Discharger tethers caged mussels in the discharge's vicinity to evaluate whether the discharge is causing sublethal biological effects. Mussels are deployed at three ocean stations for 90 days. Their tissues are then analyzed for bioaccumulative metals and chemical compounds. The data are evaluated statistically.

Methods to analyze the data gathered by the receiving water monitoring program include univariate and

multivariate statistical analyses and biological indices. Univariate tests include the parametric Analysis of Variance (ANOVA) and the non-parametric Kruskal-Wallis tests. Multivariate analyses include similarity and cluster analyses. Biological indices include Margalef's species richness number, the Shannon-Wiener and the Brillouin diversity indices, Schwartz's and Simpson's dominance indices, and the Infaunal Trophic Index, employed on Southern California Bight benthic infauna only.

Sediment Sampling Results and Data Analysis.

Sediments near the point of discharge consist mostly of sand, with about 20 percent clay and 10 percent silt. ANOVA statistical evaluation found no significant differences between stations for the bioaccumulative metals and chemicals compounds. Over time, the data show no consistent trend of increasing concentrations for these pollutants. The data were compared to the results of other studies, including those by the Southern California Coastal Water Research Project (SCCWRP) and the National Oceanic and Atmospheric Administration (NOAA). The data were found to be within the range of concentrations found at the 'reference' stations, which are stations outside the influence of any waste discharges. Moreover, the data were below levels established in the NOAA studies above which a "possible" adverse effect on sensitive benthic biota could occur. Based on these findings, staff concludes the discharge likely causes no adverse effects on the sediment near the discharge.

Benthic infauna sampling results and analysis.

Benthic infauna live in and on the bottom sediments. The community is very important to habitat quality because it provides food for fish and macroinvertebrates. The types of species present can indicate the state of the habitat. That is, polychaete annelid worms, crustaceans, and molluscs, dominate in shallow, silty habitats while nematode oligochaete worms may dominate in contaminated areas or where storms have frequently disturbed the benthos.

Biological indices listed earlier are described in more detail below, and their applications to the results of benthic sampling are illustrated. In addition to identifying the dominant species, the health of the benthic habitat may best be measured by the diversity of the organisms present, rather than by their abundance. Environmental stresses, such as poorly treated or improperly diluted discharges from wastewater treatment plants, can eliminate sensitive species and provide opportunities for the hardier species to proliferate. More individuals of the hardier

species can survive because competition has been removed.

The Shannon's Diversity Index and Margalef's Richness Index measure the distribution of individuals across the number of species in a sample. The Schwartz Dominance Index is the minimum number of species required to account for 75 percent of the individuals in a sample. A higher dominance index indicates a healthier habitat, and correlates with species diversity.

Higher values of the Infaunal Trophic Index denote California species dominated by suspension feeders, which tend to characterize unpolluted environments. Lower index values denote domination by deposit feeders, which tend to inhabit sediments high in organic pollutants. Values of 60 or above indicate "normal" bottom conditions, while values below 30 indicate "degradation". Results should be interpreted with some caution because the index is based on the open ocean coastline in southern California at the 60-meter depth contour, substantially deeper than the Discharger's stations at 24 meters.

The Discharger compared the number of individuals and species, biomass, and the diversity, richness, dominance and infaunal indices described above between all six ocean stations. The stations nearest the outfall diffuser (B4 and B5) exhibited essentially identical values for the indices throughout the past five years of monitoring. The Infaunal Trophic Index also exhibited values indicating a healthy habitat at all stations, typically in the 70's and 80's.

The Discharger evaluated the habitat's health by means of cluster analysis, which evaluates the pattern of species distribution. The analysis compares species distribution from station to station and species group to species group. The distribution pattern from station to station indicated no trends likely due to pollution, and the species found are not thought to tolerate polluted sediments (crustaceans, mollusks, and polychaete worms).

The Discharger compared the results noted above with the results SCCWRP studies in 1978 and 1996, which analyzed grab samples obtained throughout southern California. The studies identified areas outside the influence of any sources of pollution. All Goleta area infaunal variables were well within the ranges of those measured from the areas free of pollution, indicating Goleta's monitoring stations are also unpolluted.

The Discharger lastly compared the infaunal variable over time, and found that three indices (abundance of individuals and species, and richness) have declined over the last five years. No decline is evident for these indices in the years preceding the El Nino event, which is thought to have probably caused the declines. El Nino brings warm, clear, nutrient-poor waters into the Santa Barbara Channel from the south, in contrast to the nutrient-rich waters usually provided from the north. The nutrient-poor waters foster less plankton growth, thereby reducing growth in the entire food chain, which depends on the plankton.

Demersal fish and macroinvertebrates sampling results and analysis. At the two trawl stations, the Discharger collected fish, crabs, and the like from the seafloor, weighed the catch, counted the individuals and species, and computed the Shannon diversity and Schwartz dominance indices. Lastly, the Discharger compared the sample means with the Student's t-test, and found no significant differences between the stations for any variable. No change in any variable was detected over time, and the variables were consistent with those measured by SCCWRP in 1994. All trawl population variables were within ranges measured by the 1994 SCCWRP study. Fish species exhibited the trophic structure and productivity expected in this area, in addition to comparing favorably to the results of the 1994 SCCWRP study. Macroinvertebrate species were patchily distributed with fewer individuals, preventing adequate evaluation because the indices could not be computed. However, the macroinvertebrate species are heavily preyed upon by higher species in the food chain. This could account for the fewer individuals captured in the trawls. Inspection of the catch over the past five years has found no lesions or tumors indicative of diseases. Mass mortality has not been observed nor has the presence of opportunistic species near the outfall diffuser.

Bioaccumulation Sampling Results and Data Analysis. Some waste constituents, including metals and some synthetic organic compounds, resist natural biodegradation. They therefore remain in the environment for very long times. Bioaccumulative compounds build up in the tissues of organisms that ingest them, and can build up in the food chain, increasing to toxic concentrations in organisms at the top of the food chain.

The Discharger sampled fish obtained from the two trawl stations and invertebrates from the mussel stations, and analyzed tissue samples for metals and organic compounds known to be persistent and

bioaccumulative. No bioaccumulation was observed. Tissue concentrations were similar to those found at reference (control) stations by a number of other studies, conducted by the State Board, SCCWRP, NOAA, and others.

Almost all values were less than published State and federal limits, although some slightly exceeded the limits at all stations. That is; the limits were slightly exceeded at the field controls and the samples obtained offshore from Montana de Oro State Park, in San Luis Obispo County.

The Discharger monitors for bacteria at seven stations in the surf-zone on a weekly basis. The stations reach from just northwest of the point of discharge to the beach just east of the mouth of Goleta Slough. Monitoring has continually found elevated bacteria concentrations only when Goleta Slough is discharging to the ocean.

Conclusion. As described in detail above, the benthic monitoring program evaluates sediment for increases in the concentrations of metals and chemical compounds; measures the abundance, diversity, and trophic status of benthic infauna, demersal fish, and macroinvertebrates; and measures the levels of bioaccumulative compounds in fish and macroinvertebrates. The Discharger compared the program's results to the results from a number of other studies. In almost all cases, the data demonstrate that the seafloor nearest the wastewater's point of discharge exhibits the same species abundance, diversity, and richness as areas distant from the outfall diffuser. (An exception is the loss in population and diversity recorded in the past five years, attributed to the effects of El Nino. Population, richness, and diversity increased in the five years before 1996. Thus, no net trend has emerged)

The modeling described above also conservatively predicted the discharge causes insignificant solids deposition and oxygen depletion, which support the benthic monitoring program's findings. Based on the results of monitoring, modeling, and comparisons of the data with the results of other studies, staff concludes the discharge is not threatening to impair the marine habitat beneficial use. In spite of the extensive and detailed monitoring and modeling.

DISCUSSION OF THE DISCHARGE'S EFFECT ON SHELLFISHING AND RECREATION

Introduction. Oyster or mussel growing operations may be found in the Goleta area's coastal waters. Oysters and mussels strain their food from the ambient seawater with filter mechanisms, which concentrate any disease-causing organisms present in the seawater to higher, possibly unhealthful concentrations.

Santa Barbara County coastal waters currently contain two commercial shellfishing leases. The lease nearest Goleta is approximately five miles east of the outfall, and extends from a point one-quarter-mile offshore from Arroyo Burro Creek to the Santa Barbara Lighthouse. This lease is not currently active. The second lease is approximately 18 miles east of the outfall, and as such, is distant to be affected by the discharge. The State Department of Health Services maintains a prohibition zone for a one-mile radius around the outfall diffuser. No commercial shellfishing is permitted in this zone.

To protect shellfishing, the Ocean Plan requires Ocean waters to contain no more than a median coliform density of 70 total coliform/100 mL, and no more 230 MPN/100 mL in ten percent of the samples. To protect body-contact recreational uses such as swimming, snorkeling and the like, ocean waters must contain less than 1,000 total coliform per 100 mL, and fecal coliform less than 200 per 100 mL.

Discussion. As noted above, the MRP's Receiving Water Monitoring program requires fecal coliform, total coliform, and enterococcus monitoring at all six ocean, plume, and nearshore stations at the surface, middle and bottom of the water column. With few exceptions, essentially no bacteria were detected at any receiving water station. For example, in 1997, 1998, and 1999, quarterly monitoring at 13 stations found total coliform at less than two MPN/100 mL in 98 percent of samples, on average.

Effluent limitation 2.c for total coliform is 2,400 MPN/100 mL, EL 2.e requires the Discharger to maintain a total chlorine residual concentration of five mg/L. The purpose of maintaining five mg/L is to ensure the treatment plant achieves its best disinfection possible. The result of maintaining substantial chlorine residual is low bacterial concentrations. The Discharger monitors effluent bacterial concentrations at the end of the chlorine contact chamber before the wastewater enters the outfall. From 1996 through 2001, the plant discharged an average total coliform concentration of 57 MPN/100mL.

Computer modeling estimates the outfall diffuser system provides a dilution ratio of 111 parts seawater

to one part wastewater at the boundary of the zone of initial dilution, about ten meters from the discharge nozzles on the diffuser. Therefore, expected coliform concentrations would be less than one percent of the concentrations found at the plant. That is, at the dilution zone boundary, the expected bacterial concentrations are always less than one. The receiving water monitoring described above confirmed these results.

In November 1994, EPA contracted with Tetra Tech, Inc. and Environmental Analysis and Modeling to calculate coliform bacteria transport from the plant's outfall. In this study, new calculations were made to estimate the concentration of coliform bacteria at two distances from the outfall. The concentrations of coliform bacteria were estimated at one mile from the terminus of the outfall diffuser to determine compliance with Ocean Plan water quality objectives. Coliform bacterial concentrations were also estimated at four miles east-southeast of the diffuser to predict the effect plant effluent may have on the nearest lease area. The steps in this study included analysis of new current data collected during 1990-1993, and the calculation of bacteria transport, dilution, and die-off. The results of these analyses estimate the maximum concentration of total coliform bacteria at one mile from the diffuser is 13 MPN/100 mL, while the maximum concentration of total coliform bacteria at the lease area will be <1 MPN/100 mL. Both of these estimates are based on an effluent coliform concentration of 2,300 MPN/100 mL. The results of this analysis are consistent with receiving water-monitoring data, which demonstrate that Ocean Plan water quality objectives for bacteria are being met in the vicinity of the plant outfall.

Conclusion. Based on the monitoring data, it appears the purposed effluent limitation are protective of both the shellfishing and the body contact beneficial uses at the dilution zone boundary. Therefore, compliance with the proposed effluent limitations should protect the shellfishing use outside the prohibition zone, and will not pose a threat to any recreational uses.

DISCUSSION OF VIRUSES

Introduction. In recent years, concern has increased regarding the health risk posed by viruses in wastewater discharged to surface waters. In accordance with NPDES permit requirements, Dischargers are required to adequately treat, disinfect, and dispose of wastewater to remove the threat of pathogens to the public health or aquatic life. Monitoring for bacteria may not address all concerns

regarding health threats from viruses. Does disinfection adequate to reduce bacteria to safe levels also reduce viruses to safe levels? If viruses are found in wastewater discharges or receiving waters, are they a threat to the public's health?

Background. In June 1999, a citizen's group analyzed the Discharger's effluent and surface waters along the coast for viruses by the Reverse Transcriptase Polymerase Chain Reaction (RT-PCR) method. The Discharger had the same samples analyzed according to the Total Culturable Virus Assay, an EPA-approved method (EPA Method ICR 600/R-95/178). Applying this method to the discharge found no culturable viruses, suggesting the viruses detected in the prior analysis were also nonviable.

Discussion. A University of California Study by Rachel T. Noble (*Enterovirus detection in storm drain-impacted waters along the shoreline of the Southern California Bight*) concluded, among other things:

"The RT-PCR identifies the presence of viral ribonucleic acid (RNA) based upon conserved sequences of RNA found within the viral genome of specific virus families, in this case enteroviruses, without distinction as to whether the viral RNA is free or contained within an infective viral particle. *Work is underway to define whether a relationship exists between the detection of the genetic material of a virus and the presence of infectivity. To this end, RT-PCR must be combined with other measures, such as direct plating of coliphages or cell culture techniques to assess infectivity.*"

Consistent with this statement, the Discharger had the samples analyzed by means of an approved cell culture technique and determined the sample contained no infective viruses.

To protect water quality and beneficial uses, Regional Boards adopt standards in NPDES permits from statewide plans, including the Ocean Plan. The Ocean Plan currently specifies no standard for viruses. Approximately every three years, the State Board reviews the Ocean Plan and adopts new standards and objectives. State Board staff do not plan to propose a virus standard for inclusion in the Ocean Plan at this time, as discussed below.

The analytical methods available for virus detection currently are not ready for routine use, for the following reasons:

- The results are unreliable, with as many as 50 percent false negatives resulting. (A false

negative is a false claim that no virus is present.)

- Methods require samples of large water volumes, on the order of 100 liters.
- EPA reports substantial inconsistency between current methods, although methods are improving.
- Some methods are not viable means to predict a surface water's health threat, such as the Reverse Transcriptase method noted above. This method counts fragments of viruses and unculturable, nonviable viruses.
- No viral indicator species has been chosen by either the scientific community or public health agencies.

Moreover, the Ocean Plan's existing fecal and total coliform standards to protect shellfishing and body-contact recreation more conservatively protect the public's health than a species-specific viral test. That is, the coliform tests monitor the presence of fecal matter, which potentially harbors all pathogens, including bacteria and viruses.

Conclusion. Although monitoring for viruses does provide some interesting data neither the Ocean Plan nor any other regulations have established a standard to which the monitoring results can be compared. Regional Board staff will continue to present study findings to staff in the State Board's Oceans Standards Unit for their consideration in future revisions to the Ocean Plan.

COMPLIANCE HISTORY

The following discusses the Discharger's compliance history with effluent and receiving water limitations not discussed above.

Effluent limitations. As noted above, in 2000, the plant discharged at an average concentration of 62 mg/L BOD, and 39 mg/L TSS, complying with effluent limitations of 98 mg/L, and 63 mg/L respectively. The plant continually complied with the limits throughout the past permit cycle (1996 to the present). During this time period, staff conducted four random, unannounced sampling inspections. As described in the attached - Internal Memo: *Effluent Self-monitoring Results compared to this Board's Monitoring Results, Goleta Sanitary District* (Attachment 1) -the staff's sampling results were similar to the Discharger's. The discharge also complied with the Ocean Plan's Table A effluent limitations for: grease and oil, settleable solids,

turbidity, pH, and acute toxicity, and the Table B limitations for priority toxic metals and synthetic chemical compounds.

Receiving water limitations. Receiving water limitations C.6, C.8, C.9 prohibit the discharge from degrading the Ocean's ability to transmit natural light, reduce dissolved oxygen concentrations, or excessively change pH, respectively. Extensive monitoring results demonstrate the discharge has not exceeded these limits.

PRETREATMENT PROGRAM

In accordance with federal statute, the proposed Order and Permit requires the Discharger to implement a pretreatment program as specified at 40 CFR 403. The Discharger has implemented a program approved by the Regional Board and EPA, and overseen by the Executive Officer. Staff has conducted annual compliance inspections of the Discharger's program, and a more extensive audit every five years. (In 2001, a consultant approved by EPA performed the audit). Inspections and audits have continually found the Discharger's program to be comprehensive and proactive.

In the summer of 2001, EPA recognized the District's pretreatment program with an award granted through its National Pretreatment Excellence Awards Program. EPA ranked the program second in the nation for municipalities in the Discharger's population range. The award was based on the Discharger's innovative and exemplary approach to enforcement, industrial user monitoring and permitting, public outreach, innovations in program implementation, and environmental achievements.

SEWER SYSTEM OPERATION AND MAINTENANCE (O&M) PROGRAM

The Discharger conducts a comprehensive O&M program to monitor, repair and renovate its sewer system. The program includes the following components:

- Spill response, reporting, and record-keeping procedures. The Discharger maintains adequate equipment, such as jet-rodders and trash pumps, to clear clogged sewers.
- Sewer system maintenance programs, which include a maintenance management computer program to track closed-circuit television, trouble spots, and line cleaning activities, and a sewer-cleaning program. The Discharger

cleans out its entire sewer system every two years, with an annual average of nine miles receiving root control.

- Source control program to reduce the amount of grease entering the system. The Discharger's ordinances require restaurants that discharge substantial quantities of grease to install interceptors. The program includes a manifest system to ensure grease is disposed of properly.
- In accordance with its Sewer Master Plan (revised in 2000), the Discharger plans to renovate 2.3 miles of sewer line over the next five years.

The proposed Order and Permit requires the Discharger to include a report on the O&M program as part of its annual report to this Board.

ADDITIONAL REQUIREMENTS AND PROPOSED CHANGES

Receiving water limitations. The proposed Order contains additional Ocean Plan receiving water limitations beyond those discussed above. These limitations prohibit the discharge from causing floating particulates and grease and oil to be visible, or discoloration, on the ocean surface; or a significant increase in sulfides on and near bottom sediments.

The proposed Order also continues a Toxicity Reduction Evaluation (Evaluation) requirement in case persistent violations of the toxicity limitations occur. If the discharge consistently exceeds an EL based on toxicity objectives of the Ocean Plan's Table B, an evaluation is required. The evaluation shall include all reasonable steps to identify the source of the toxicity. Once the source(s) of toxicity is identified, the Discharger shall take all reasonable steps necessary to reduce toxicity to the required level. The requirement specified in the proposed Order also establishes the time schedule for implementing the Evaluation.

Biosolids. The proposed Order and Permit implements biosolids requirements pursuant to 40 CFR 257, 258, 501, and 503, including applicable monitoring, recordkeeping, and reporting requirements.

Bacterial standards exceedance actions. The proposed Order and Permit requires bacterial assessment and remedial action requirements associated with exceedances of specified enterococcus densities, or consistent exceedances of total and fecal coliform bacteria water quality objectives.

Proposed change to receiving water monitoring program. To evaluate compliance with water quality objectives, the proposed MRP continues the existing program with some modification. The proposed Order requires seven surf zone stations to be monitored weekly for total and fecal coliform bacteria, and enterococcus. In contrast, the existing program requires weekly and bi-weekly monitoring. The proposed Monitoring Program requires all other receiving water monitoring stations to be monitored at the same frequencies as the existing MRP.

CEQA. The adoption of waste discharge requirements for this discharge is exempt from the California Environmental Quality Act.

California Water Code (CWC) §13263.6(a). This section was added to the CWC by the enactment of SB709 (Migden). The section requires the Regional Board to prescribe ELs as part of the waste discharge requirements for a Publicly Owned Treatment Works (POTW) for all substances that the most recent chemical release data reported to the State Emergency Response Commission pursuant to Section 313 of the Emergency Planning and Community Right to Know Act of 1986 (42 U.S.C. Sec.11023) (EPCRA) indicate as discharged into the POTW, "for which the state board or the regional board has established numeric water quality objectives, and has determined that the discharge is or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to, an excursion above any numeric water quality objective." The reporting requirement for Section 313 of the EPCRA applies to owners and operators of facilities that: 1) have ten or more employees, 2) are in Standard Industrial Classification (SIC) codes 20-39, and 3) manufacture, import, process, or otherwise use a listed toxic chemical in excess of specified threshold quantities.

This Board has adopted numeric water quality objectives in the Water Quality Control Plan for the Central Coast Basin for the constituents specified in the Effluent Monitoring section of MRP No. RB3-2002-0021.

Reasonable Potential Analysis. The Regional Board staff did not require nor did the Discharger propose to conduct a Reasonable Potential Analysis (RPA), identifying the potential for the Ocean Plan's Table B constituents to exceed an EL. Therefore, the proposed Order continues to specify ELs for all Ocean Plan constituents.

Anti-backsliding. ELs included in Order No. RB3-2002-0021 are identical or more stringent than those in Order No. 96-21. Therefore, the proposed ELs do not constitute backsliding in accordance with U.S.C. § 1342(O)(2)(b)(I).

Stormwater. The Discharger captures all stormwater on the treatment facility site and routes it through the plant. Therefore, the Discharger is exempt from the Industrial Activities Stormwater General Permit.

COMMENTS

Goleta Sanitary District (Discharger).

1. **Surf-zone monitoring.** In its January 2001 NPDES application, the Discharger requested the elimination of surf-zone monitoring for total and fecal coliform and enterococcus bacteria from the renewed Permit. The request is based on the results of approximately 10 years of effluent, surf-zone and Ocean monitoring.

In 2000, effluent total coliform averaged 59 MPN/100 mL, 9 MPN/100 mL for fecal coliform, and 5 MPN/100 mL for enterococcus. The Discharger notes the results are less than the standards specified in the California Ocean Plan to protect any beneficial use. On the other hand, surf-zone monitoring during the rainy season has found higher bacteria concentrations than found in the discharge or the Ocean near the point of discharge. These results imply another source for the bacteria found in the surf-zone. The source is likely the Goleta Slough, in which monitoring invariable finds high bacteria concentrations.

Santa Barbara County's Environmental Health Services Department (EHS) monitors the surf-zone every week. EHS publishes the data in a local newspaper with general circulation.

Based on this information, the Discharger suggests adding the following limitation to the proposed Permit:

"If three consecutive effluent total coliform bacteria tests exceed 16,000 MPN/100 mL, samples shall be collected at surf zone stations A, A1, A2, B, C, D, and E, and analyzed for total and fecal coliform and enterococcus organisms once per week. Sampling will continue until the effluent bacteria total coliform concentration returns to compliance."

Staff Response. Staff recommends the proposed Order continue to require weekly surf-zone monitoring, based on the following factors:

- The results of surf-zone monitoring demonstrate the absence of the discharge's effect on the beach, and thereby justify the level of treatment to the wastewater.
- Monitoring is necessary because a slight chance exists that the discharge will contact the beach,
- The data tend to demonstrate that the discharge is not degrading the surf-zone's water quality, and
- Surf-zone monitoring provides a public service by confirming whether or not beach use is safe.

2. **Change to Bioaccumulation Monitoring in M&RP No. RB3-2002-021.**

The proposed MRP's Section VII specifies bioaccumulation monitoring requirements. The Discharger proposes to delete the tests for Shell Cavity Weight, Condition Factor, and Gonadal Index. The reference document for these analyses states the tests are inaccurate with mussels smaller than 7 cm. The MRP's Section VII.B requires the test mussels to be between 5 and 8 cm., the local size range for these animals. The tests have never been conducted because the annual mussel collection has gathered too few mussels between 7 and 8 cm.

Staff Response. Staff concurs and removed the requirement.

3. **Shellfish grower notification.** The Discharger requests removal of the following phrase from proposed Effluent Limitation 2.c:

"... and any certified commercial shellfish growers in the vicinity of the outfall"

The proposed effluent limitation requires the Discharger to notify the State Department of Health Services Preharvest Shellfish Sanitation Unit (PSSU) and shellfish growers if disinfection fails at the treatment plant. The Discharger states that it cannot determine when a shellfish grower should cease harvesting nor require a grower to cease.

Staff Response. The proposed limitation does not require the Discharger to determine if/when a

shellfish should cease harvesting. Staff believes it is appropriate for the Discharger to notify Health Services and growers if the plant experiences a loss of disinfection. The grower may then decide to cease or postpone harvesting. The Discharger's notification does not imply its authority or responsibility to require the grower to cease harvesting, which is within the purview of the PSSU. Staff recommends the proposed Order retain the language.

4. **Bacterial assessment survey.** The Discharger requests altering of the word "require" from RWL C.3, which would result in the following:

The wording requires the Discharger to conduct the assessment even if the exceedances are the result of circumstances beyond the Discharger's control.

Staff Response. Staff concurs, and proposes to change RWL C.3, as follows:

"The Executive Officer may require the Discharger to conduct or participate in a bacterial assessment...."

5. **Collection System Maintenance Program.**

Wording should be changed to include all satellite agencies that operate collection systems within the service area. Hence, the Permit's Page 11, Column 2, First Paragraph should now read as follows: "The Discharger, and all local sewerage entities listed in this permit, shall implement a ..."

Page 12, Column 1, Second Paragraph should read "In its annual report to the Executive Officer, the Discharger and all local sewerage entities listed in this permit, shall describe the following..."

Staff Response. Staff concurs, and changed the proposed Order accordingly.

Proposed Changes to MRP No. RB3-2002-021

6. Influent Monitoring, Page 2, Paragraph 1. The Discharger proposes changing the language to the following:

"Sampling station shall be established at a feasible location at the head works of the wastewater

treatment plant where representative samples can be obtained."

Staff Response. Staff concurs, and changed the proposed MRP accordingly.

7. Receiving Water Monitoring, page 12, Section A. The Discharger requests removing reference to the Trimble Differential Global Positioning System, which is an outdated system.

Staff Response. Staff concurs, and changed the wording to require the use of an accepted GPS system with the necessary accuracy.

8. Bioaccumulation Monitoring, Page 19, Section B. The Discharger requests removal of the following:

"No later than 45 days following the effective date of this Order and Permit, the Discharger shall submit...a proposed shellfish monitoring program..."

The Discharger completed this task in the last permit cycle, and the monitoring program is now setup to run as described in the program.

Staff Response. Staff concurs, and removed the language.

9. The Discharger noted a number of minor errors of fact in the draft Staff Report, Order, and MRP, which staff corrected.

Preharvest Shellfish Sanitation Unit, California **Department of Health Services**

The Department of Health Services (Department) is concerned over waste discharge requirements that may allow inadequate disinfection of bacteria and, especially, viruses. The Department is also concerned over the recreational uses of coastal waters of southern Santa Barbara County.

Staff Response. US EPA and Regional Board staff are also concerned with these same issues. Staff believes the proposed Order adequately addresses these issues.

1. Proposed Order, Page 7, Paragraph B.2.c. The Department recommends the Discharger notify commercial shellfish growers near the point of discharge immediately, or in no case later than four hours, after learning of a loss of disinfection at the treatment plant.

Staff Response. The relevant text from proposed Effluent Limitation 2.c follows:

- c. As soon as possible after learning of a significant loss of effluent disinfection, the Discharger shall notify the Department of Health Services Preharvest Shellfish Sanitation Unit, the Regional Board, *and any certified commercial shellfish growers whose growing areas are within five miles of the outfall.*

Hence, the proposed Order complies with PSSU's suggestion.

2. The Department "strongly recommends" that the proposed Order require the Discharger to disinfect its effluent to ensure the total coliform do not exceed a seven-day median of 23 MPN/100mL, and no single sample should exceed 430 MPN/100mL. This is the standard applied to Montecito, Summerland and Carpinteria Sanitary Districts.

The maximum limit is recommended to address the serious situation where little or no disinfection is provided for a limited period. The limit is approximately 20 times the median so it will not be exceeded due to statistical variation in the coliform test, or due to other factors.

The Discharger's December 2001 self-monitoring report shows a monthly total coliform average of 23 MPN/100 mL, with a maximum of 240 MPN/100 mL. These results indicate the Discharger can achieve the Department's proposed limitations.

The Department proposes the following:

"The median number of total coliform organisms in the effluent shall not exceed 23 MPN/100 mL as determined by the bacteriological results for the last seven days on which analyses were completed, and the number for total coliform organisms in any sample shall not exceed 430 MPN/100 mL. The density of total coliform organisms shall be monitored during chlorine contact maintenance procedures. Immediately, and in no case longer than four hours after learning of a loss of effluent disinfection, the Discharger shall notify any certified commercial shellfish growers in the vicinity of the outfall, the Department of Health Services Preharvest Shellfish Sanitation Unit, and the Regional Board."

Staff Response. The following discussion, based on monitoring results, supports the effluent coliform limitations in the proposed Order.

Required effluent chlorine concentration. Effluent Limitation No. 2.e requires the Discharger to maintain at least five mg/L chlorine at the completion of the disinfection process. This requirement ensures the plant achieves its maximum level of disinfection by exposing bacteria in the wastewater to excess chlorine concentrations at all times. Monthly average total coliform concentration found in the discharge from 1996 through 2000 ranged from a low of five MPN/100 mL to a high of 176, substantially less than the Order's effluent limitation on coliform, discussed below.

Effluent limitation on coliform. Existing Order No. 96-21's EL 2.d requires the discharge to contain no more than 2,400 MPN/100 mL of total coliform in 90 percent of the effluent samples taken in any 30-day period, with no sample to exceed 16,000 MPN/100 mL. Proposed EL 2.c continues the limitation. MRP No. 96-21 requires the Discharger to sample the effluent for coliform five days per week.

As discussed below, the results of effluent and receiving water monitoring, and other factors, demonstrate the effectiveness of the plant's disinfection system at protecting the Pacific Ocean's shellfishing and recreational beneficial uses. The Discharger monitors total and fecal coliform and enterococcus bacteria at 13 stations in the ocean near the point of discharge. The Discharger obtains quarterly samples from each station both near the seafloor and the water surface. In 98 percent of seawater samples, monitoring has found less than two bacteria per 100 mL, with an occasional anomalous result. As noted earlier, (Tables IIIE-2, IIIE-3, and IIIE-4 in the Application provide the monitoring results for 1997, 1998, and 1999, respectively).

In accordance with the Ocean Plan, both existing and proposed receiving water limitations limit coliform in the ocean. However, the limits are substantially higher than the coliform concentrations found by monitoring the ocean. To protect the recreational use, RWL No. C.1 limits total coliform within a zone 1,000 feet from the shoreline to less than 1,000 MPN/100 mL. To protect shellfishing, Limitation No. C.2 limits

median total coliform to less than 70 MPN/100 mL.

The Discharger's monitoring near the discharge point, at stations likely to experience the highest bacteria concentrations, found less than two MPN/100 mL in 98 percent of the samples. Monitoring results demonstrate the plant's disinfection system has continually protected the shellfishing and recreation beneficial uses. Moreover, population and plant loading projections will increase moderately, as discussed earlier in this report.

Achieving 23 MPN/100mL total coliform in the effluent. The Department's comments state the Discharger's December 2001 monitoring report "indicates that the recommended limits are achievable." Five-day per week effluent monitoring from 1996 through 2000 found monthly average total coliform less than 23 MPN/100 mL during only eight months, or 13 percent of the time. Moreover, of 1,383 seven-day median total coliform, 651 exceeded 23 MPN/100mL (47 percent), substantially greater than the limit proposed by PSSU, based on a single month's effluent monitoring.

Failure of disinfection. The Department recommends its limit based on its concern for the discharge's potential to impair the shellfishing and recreational beneficial uses if the plant's disinfection processes fail for a limited period. However, an effluent limitation of any magnitude will not prevent adverse effects caused by an undisinfected discharge on the ocean. As discussed above in staff's response to the Department's Comment 1, proposed EL No. 2.c will likely prevent adverse effects on shellfish from failures in disinfection by requiring the Discharger to immediately notify the Department, the Executive Officer, and any shellfish growers near the point of discharge when disinfection fails. It should be noted that the only active lease in County waters is approximately 1-½ miles east of the City of Santa Barbara's treatment plant in water demonstrably safe for commercial shellfishing. The lease is more than 10 miles from the Discharger's plant, and is likely safe from a discharge of undisinfected effluent lasting less than a week or two.

3. EL 2.e requires no immediate corrective actions if effluent coliform levels exceed the maximum limit for a sample, and only requires a report in three

months if three consecutive monthly averages exceed the limit. Other plants in the area are required to conduct additional monitoring immediately up coast and down coast of the point of discharge when the limit is exceeded. The Department recommends the proposed Order include additional sampling and monitoring requirements.

Staff Response. Staff agrees. Staff modified the proposed EL to require additional surf-zone monitoring daily for one week if three samples exceed the limit.

4. Receiving Water Limit C.2 limits total coliform in the ocean to less than the Ocean Plan's limits. The Department recommends changing the limit to the fecal standard recommended in the national Shellfish Program's Model Ordinance, adopted by the State of California.

Staff Response. Staff agrees and will add the fecal standard to RWL C.2.

5. RWL No. C.3 requires actions when the enterococcus organism concentration is consistently exceeded. The Department recommends more specific conditions for initiating corrective actions.

Staff Response. The proposed limitation comes directly from the Ocean Plan. It allows the Executive Officer the discretion of requiring a bacterial assessment if enterococcus concentrations exceed the specified limitations. Historic monitoring indicates enterococcus organism concentrations have not exceeded RWLs. No changes are recommended to the proposed order.

Viruses.

6. The Staff Report's discussion indicates the analytical methods used to detect viruses are unreliable, with as many as 50 percent false negatives resulting. Please provide a reference for this statement. It should also be noted that the PCR (staff assumes 'PCR' denotes the reverse transcriptase analytical method) also detects whole viruses, so the test could also indicate viable viruses.

Staff Response. A false negative result states that an organism is not present when it is. The RT-PCR method often indicates that whole viruses are present when only a part of a virus is present. In that case, the

method falsely indicates infectivity, since a piece of a virus is unlikely to be active. EPA-approved methods with improved accuracy require large sample sizes, which render the tests infeasible for general use. Please also see the Staff Report's discussion of viruses, beginning on page 11.

7. Bacterial indicators do not adequately protect the public's health from viral pathogens, as evidenced by the recent outbreak of a Norwalk-like virus from the consumption of oysters grown in Tomales Bay. At the time, the growing area complied with bacterial standards before, during, and after the harvests. Viruses have caused most recent illness outbreaks linked to the contamination of shellfish growing areas worldwide. In Florida, seven outbreaks occurred, although fecal coliform concentrations in the growing area waters and in the oyster meat complied with fecal coliform standards. Norwalk-type viruses were found in the infected people. Preliminary findings indicate that recreational and commercial boaters may have improperly discharged sewage overboard. A similar outbreak was traced to a faulty sewage system. The federal Center for Disease Control has been quoted: "improved indicators of viral contamination of both water and oysters are needed since fecal coliform levels often correlate poorly with the presence of viruses." Recent research showed that ocean waters testing free of bacteria harbored viruses. It is also established in the literature that some viruses are more resistant to disinfection than bacteria.

Staff Response. Comment noted. Staff agrees that viral standard is likely needed, although public health agencies have reached no consensus on the issues to date. Accordingly, in its comments PSSU does not recommend the Board adopt a viral effluent limitation or monitoring requirement.

The 2001 Ocean Plan specifies no limit on any virus, and State Board staff reports they do not currently plan to propose a limit. As noted in the discussion beginning on page 11, several factors contribute to their understanding that the analytical methods available for virus detection currently are not ready for routine use. In addition, neither the scientific community nor public health agencies have chosen a viral indicator species. Please see this report's **Discussion of Viruses** for more detail.

Heal the Ocean

1. The Discharge does not meet the waiver criteria, because the discharge is contributing to Goleta Beach water pollution.

Heal the Ocean (HTO) analyzed the ocean and discharges from two treatment plants for viruses. Sampling was conducted according to University of Southern California guidelines, and laboratory researchers provided equipment and instruction to HTO's staff. The results of five rounds of sampling were attached to the comment letter, as were USC's actual reports of samples on August 4, 2001 and Fall 1999.

The August 2001 analyses found enteric viruses in the Discharger's final mixing pond, where primary and secondary effluent combines before discharge to the ocean. A Goleta Beach sample on the same day also found human enteric viruses. The Fall 1999 samples found Hepatitis A and enteric viruses at Goleta Beach.

The USC researcher who conducted the analyses states the viruses must have originated with people, and they must have been alive at the time of collection. Primary treatment solids shield viruses and bacteria from chlorination.

Staff Response. HTO found viruses in wastewater at the Discharger's sewage treatment plant. Human body waste contains viruses and bacteria. The wastewater treatment plant removes most bacterial and viral pathogens, but some may remain, as demonstrated by the presence of coliform bacteria in the discharge after disinfection. The proposed Order controls pathogens in the discharge by requiring the Discharger to adequately treat the wastewater and to maintain a minimum chlorine residual of 5 mg/L in the chlorine contact chamber. Daily effluent monitoring over a five year period has found an average of 57 MPN/100 mL total coliform. Based on conservative modeling approved by USEPA, the outfall diffuser system reduces effluent bacteria and viruses by a factor of about 100 to one; that is, to insignificant concentrations that likely pose little threat to the public's health. As predicted, quarterly monitoring of the ocean near the point of discharge has continually found less than two bacteria per sample. More than 10,000 data resulted from the Discharger's monitoring over the past three years, almost all below analytical results two MPN. The effluent likely contains some viruses, but treatment has probably reduced their numbers, like the bacteria, to insignificant levels near the point of discharge.

2. Brown and Caldwell's 1986 and 1987 drogue studies found an inshore drift from the point of discharge, allowing the sewage effluent to drift onshore at certain times of the year. As noted in the attached Sea Foam report, the current studies in the Discharger's monitoring program cannot evaluate the transport of the discharge to shore. The Discharger identifies Goleta Slough as a source of inshore pollution. However, HTO's August 4, 2001 sampling found no enteric viruses in the Slough, while testing found viruses in plant effluent and at Goleta Beach.

Heal the Bay's "Beach Report Card" for Goleta Beach, based on Santa Barbara County's weekly monitoring from June 1999 to the present, found 48 percent received a "failing" grade. The "Report Card" found many "passing" grades during wet weather, when the Slough was running full, and likely pushing the ocean away from the Beach. A representative Santa Barbara County test result from August 6, 2001 found enterococcus levels exceeding State standards during the dry time of year.

In conclusion, the waiver must be denied because human viruses were found on Goleta Beach and in the plant's discharge, and the many "failing" grades given to Goleta Beach, there is ample evidence the human fecal matter is adversely affecting public water supplies. In addition, the plant discharge is adding alone or in combination with pollutants from other sources to the pollution of Goleta Beach.

Staff Response. Current monitoring data shows occasional onshore current drift for short time periods. Over 1,200 analyses per year from weekly surf-zone monitoring have detected total and fecal coliform and enterococcus bacteria at Goleta Beach only during periods in which the Goleta Slough is discharging. In contrast to HTO's single datum on August 4, 2001 demonstrating the presence of either part of a virus or an entire virus in Goleta Slough, 1,200 surf-zone data each year and over 10,000 data from ocean monitoring data strongly indicate the plant's discharge is not degrading water quality at Goleta Beach.

Weekly surf-zone monitoring detects coliform only during the rainy season, when nearby Goleta Slough discharges into the ocean. Hence, while an onshore current may occasionally transport the wastewater discharge toward the shore, frequent monitoring has not detected its effect. Additionally, no cause exists for the pathogens to increase from the very low

concentrations found in the discharge and the ocean near the outfall to the relatively high levels necessary to close the beach. The data strongly indicate the discharge from the slough is a likely source of Goleta Beach contamination. Please see the staff report's relevant sections, beginning on page 11, and staff's response to the State PSSU comments, above, for discussions of virus pollution and regulation.

3. The waiver should be denied because the Discharger's monitoring methods do not fully describe the effects of the discharge. Clean Water Act Section 301(h) requires the Discharger to establish a system of monitoring the impact of the discharge. The monitoring guidelines are over 20 years old, with new guidelines in draft form. The monitoring guidelines employed by the Discharger, therefore, do not include updated methods that would reveal the true impact of its discharge.

Furthermore, the Discharger has not conducted drogue studies to ascertain the discharge's impact. The Sea Foam report points out the inadequacy of current meters to gauge the direction of waste field drift. The Discharger's current meter studies conducted simultaneously with the Brown and Caldwell study found the currents moving downcoast while the Brown and Caldwell study found the currents moving onshore.

The Board should deny the permit because the Discharger is using outdated monitoring techniques.

Staff Response. The historical, existing and proposed MRPs were developed in coordination with US EPA staff to comply with federal 301 (h) waiver regulations and state Ocean Plan Requirements. Independent experts have also evaluated the MRP. Moreover, the sampling, analytical, and statistical techniques are common, and used in the California Bight to monitor the effects of municipal dischargers on the ocean's ecosystems.

4. The projected increase in solids discharged to the ocean will result in a thicker carpet of chlorinated sewage solids either drifting in the ocean's currents or settling around the outfall area.

The proposed Order states that the flowrate projections from the current flow of 4.7 MGD to 7.7 MGD in 2005 are acceptable. The suspended solids will increase from 1,920 pounds per day (lbs/day) to 3,064 lbs/day. The citizens of Santa

Barbara do not want 3,000 pounds of sewage solids per day either drifting to shore or into nearby kelp beds, or settling on the seafloor. Upgrading to secondary standards will reduce the solids discharged from the projected 1,950,000 pounds per year.

In its Permit application, the Discharger states, if the projections for TSS and BOD are accurate, it will pursue advanced primary treatment by way of ferric chloride addition. By its own admission, the Discharger recognizes that permit limits may well be exceeded within the permit period, and definitely by the year 2015.

The Board should deny the waiver application based on the discharge of almost double the solids quantity during the permit period.

Staff Response. As discussed in this report's section entitled **Current and Future Wastewater Characteristics**, beginning on page 5, the Discharger systematically projected wastewater flowrates and solids concentrations to the year 2015. The projections are based on the best available population projections obtained from local planning agencies and academia. In 2007, at a projected average flowrate of 5.2 MGD with maximum projected reclaimed water demand of 2.23 MGD, (representing the maximum solids emission to the ocean in 2007) the solids concentration in the discharge will be approximately 67 mg/L, above the limit of 63 mg/L. Mass loading will equal approximately 2,900 pounds per day (lbs/day).

To ensure continual compliance with the TSS effluent limitation, the Discharger evaluated the additional treatment measures. If effective, the measures will ensure compliance. The proposed Order's Provision H.11 requires the Discharger to submit the results of its evaluation and to describe the proposed treatment measures.

The Technical Decision Document Concluded that the solids discharged will have no adverse effects on aquatic life. See also **Modeling the Effect on Aquatic Life of Solids Discharged from the Plant**, beginning on page 6 of the Staff Report.

5. Each waiver should be meticulously scrutinized because Congress created the waiver policy based on its belief that the ocean could adequately dilute and disperse municipal wastewater discharges.

In 1972, Congress passed the Clean Water Act, which required Publicly Owned Treatment Works

to achieve secondary capability by 1977. Some municipalities discharging into the Ocean argued that achieving secondary standards might be unnecessary because discharges into the ocean are deeper and subject to the tides and currents. Discharges would thereby be more dispersed and diluted than their freshwater counterparts. Congress added section 301(h) to the Act, allowing for a case-by-case review of treatment requirements for marine dischargers.

Continual bacterial warnings at Santa Barbara County beaches – including Goleta Beach – are showing signs of stress. The Goleta discharge into 60 feet of water is not deep, and the Santa Barbara Channel does not provide large tides and substantial currents to allow for greater dilution and dispersion.

The Board needs to consider the Discharger in light of the 301(h) waiver program.

Fact: 208 sanitary plants applied for waivers in 1982. The status of all 208 plants follows:

- 87 applicants have withdrawn or are no longer eligible;
- USEPA denied 76 applications;
- USEPA (with State concurrence, where applicable) granted 36 waivers, with nine decisions pending;
- The Discharger is one of four California waivers;
- The waiver program was intended for small POTWs with discharges of five MGD or less, while the discharge is projected to reach 7.7 MGD;
- The application sets the District's population at 79,300 in 1999, 80,250 in 2000, 86,000 in 2005, and 92,220 in 2010, which is in the range of the permit period. The Discharger serves a large university, the airport, Goleta West, and will serve proposed development, including the 119-unit Sandpiper residential community, as well as the majority of the 17,500 new housing units mandated by the State.

In addition, HTO, which has successfully initiated septic-to-sewer conversion programs in southern Santa Barbara County, has begun the procedure by which 750 homes in Hope Ranch may vote to abandon their septic systems and hook up to the District. We are not particularly pleased to be pursuing this work when we are asked "What is so great about hooking up to the sewer? Look what they are doing."

The Board should deny the extension of the Discharger's 17-year-old waiver, and require the District to join the majority of sanitary districts that have upgraded to full secondary.

Staff Response. USEPA and this Board's staff scrutinized the data obtained from the Discharger's self-monitoring programs and this Board's confirmation sampling. Based on this evaluation, US EPA's regional Administrator and the Board's staff recommend continuing the waiver for the next five-year permit cycle. Review of, and recommendation for this waiver were made only after a careful individual case review.

7. The 301(h) waiver program was never intended to save money. The Discharger has stated that it is seeking its fourth extension of the waiver "because more sophisticated treatment to remove solids is unnecessary, and putting it off will save the District more than \$20 million."

The District's ratepayers currently pay \$13.86 per month. HTO contracted with Metcalf and Eddy (M&E) to conduct a conceptual-level cost/feasibility survey of the cost to upgrade the five coastal POTWs to tertiary treatment. M&E estimated the upgrade would increase the District's fees to \$38.51 per month. An upgrade to secondary levels is affordable because it would not cost as much as upgrading to tertiary. To delay the upgrade postpones the inevitable, which will cost that much more in the future. In San Diego's case, the delay has resulted in the upgrade to secondary becoming nearly prohibitive.

The Board must deny the waiver because the cost of upgrading when it cannot be put off any longer will cost the ratepayers that much more.

HTO appreciates the fact that the Board denied the Discharger's request for a waiver in 1994, a decision the State Board subsequently overturned. HTO asks the Board to deny the waiver request again, and thereby honor the concerns of the citizens of Santa Barbara, who no longer want to see the ocean used to dilute human waste.

Staff Response. US EPA and Regional board Staff did not use cost as a criterion for recommending approval of the 301 (h) waiver request.

Environmental Defense Center

Environmental Defense Center (EDC) submits comments on behalf of HTO and Santa Barbara Channelkeeper (Keeper). Ordinarily, NPDES permits issued to POTWs include technology-based standards known as secondary standards. "In 1977, Congress amended the CWA to include Section 301(h), which provides in certain extraordinary circumstances for a 'waiver' from secondary treatment for municipalities discharging from deep ocean outfalls." *Hawaii's Thousand Friends v. City and County of Honolulu*.

The Act puts severe restraints on USEPA's authority to issue waiver permits, requiring a series of factual findings before a waiver can be issued. EDC's comment letter is attached to this Staff Report.

1. Most POTWs have secondary treatment, and many use tertiary treatment, including ocean dischargers.

Staff Response. No ocean dischargers in the Central Coast Region treat municipal wastewater to tertiary standards prior to discharge to the ocean.

2. Waivers are to be granted in extraordinary circumstances after making factual findings, not a pro forma continuation of the status quo.

Staff Response. Neither the tentative decision by USEPA's Regional Administrator nor this Board's staff recommendation to continue the waiver are "pro forma" continuations of the waiver. As stated in the Tentative Decision Document, USEPA based its recommendation was on the results of substantial monitoring of the Ocean and effluent from 1996 through 2001, and on the "factual findings". Similarly, as noted in this report, staff also based its recommendation on an independent consideration of the same data and similar "factual findings."

3. While POTWs discharging into the ocean may have needed some time to comply with secondary treatment requirement in 1977, 25 years later, the issuance of waivers has no place in protecting water quality, especially in the oceans. The Discharger should not be allowed to discharge primarily treated waste to the ocean, given the high levels of bacteria found at Santa Barbara County beaches that result in frequent beach closures. The waiver provisions should have been phased out long ago, instead of pro forma reissuances becoming the rule of the day.

Staff Response. As discussed above, the results of effluent and receiving water monitoring demonstrate

that the discharge is not likely contributing to beach closures at Goleta Beach. Although the commenter believes “the waiver provisions should have been phased out long ago,” US EPA and Regional Board have no control over this issue.

4. The waiver application is based on modeling data, which calls into question the conclusions reached to approve the waiver. The proposed Order specifies a seawater-to-effluent dilution ratio of 111:1. The credit allows the Discharger to discharge very high pollutant concentrations to coastal waters. The credit was determined by plugging numbers into a model, which may not consider real world conditions, such as thermal or density stratification. In addition, although State and federal guidance requires the dilution modeling to be conducted on a pollutant-by-pollutant basis, the permit provides a blanket credit. We have no information about the inputs to the model. Therefore, we conclude that the model does not support the dilution credit in this case.

Staff Response. On page 5, column two of this report discusses the computer modeling conducted to estimate the initial seawater-to-effluent dilution ratio. Briefly, the model is conservative, approved by the USEPA and the Ocean Plan, and, accordingly, was run using data that represent the worst-case conditions in the ocean; that is, when the thermocline was most pronounced. Hence, the model considered worst-case “real world” conditions.

The Ocean Plan sets water quality objectives for toxic pollutants, to be met in the ocean outside the boundary of the Zone of Initial Dilution (ZID). The standards are conservatively based on the results of USEPA and State studies of the adverse effects of the pollutants on aquatic life and the public’s health. The State Board adopted the Ocean Plan’s latest version in 2001, establishing the validity of each objective. The dilution credit conservatively estimated by the approved model may then be applied to all the listed pollutants to determine the allowable effluent concentration. There is no need to calculate each limit, since experts have already spent a great deal of time to determine the maximum allowed concentration for each pollutant protective the ocean’s beneficial uses.

5. The proposed Order does not define the size of the zone of initial dilution. To provide a basis for the dilution credit the Discharger must undertake a field study, using tracers or dye testing, to establish the actual dilution achieved. Once the dilution zone is established, a pollutant-by-

pollutant analysis should be conducted. Finally, field sampling must be conducted, consistent with the methods used in NPDES permits nationwide to validate dilution and establish that no exceedances of the Ocean Plan’s limits are occurring at the ZID boundary.

Staff Response. The Ocean Plan does not require nor has Regional board staff ever recommended a field study to determine the exact size of the dilution zone. The modeling conservatively estimates the ZID and initial dilution ratio, which drives the Ocean Plan Table B effluent limitations. The conservatism in developing the models and standards renders field studies unnecessarily burdensome.

6. The factual findings needed to establish extraordinary circumstances to support a 301(h) waiver cannot be made. EDC’s comment lists the nine issues a Discharger must address to qualify for a 301(h) waiver. EDC states that HTO and Channelkeeper (EDC’s clients) are concerned that the increased discharge of solids due to increases in population over the next five years will degrade the indigenous populations of shellfish, fish, and wildlife, as well as recreation. Furthermore, EDC states that the discharge “impacts shellfish, fish and wildlife”. The statement is based on the following:

The Infaunal Trophic Index (ITI) in the outfall’s vicinity is currently 80 or better, which indicates the discharge is causing no adverse effect on the environment. “This is likely a ‘false positive’ effect on the environment if the waiver is extended.” The ITI indicated a change was underway in the ecosystem between 1992 and 1999. As the population grows, a greater percentage of the wastewater will receive only primary treatment, with increased solids in the effluent. In addition, the increased demand for reclaimed water in the future will result in more solids discharged to the ocean. The increased solids will impair aquatic habitat.

The lack of impacts on the environment are likely illusory, especially during wet weather flows, when the discharge of solids increases. For example, during the wet week of February 21, 2000, the daily solids emission reached 6,257 lbs/day, almost the limit. The discharge of solids will only increase as population grows. Infiltration and inflow problems should also be addressed. Increased solids discharged to the ocean adversely affect marine plant growth by reducing light levels, but the application did not mention these effects. The solids also settle on the seafloor, making recruitment

of both animal and plant microscopic stages more difficult. Also, viruses settle to the bottom with solids, and concentrate until divers or wave orbitals suspend them. In contrast, secondary particles settle more slowly than primary solids, and cause less effect on the seafloor. Also, disinfection of primarily treated wastewater requires more disinfectant, resulting in discharge of more toxic disinfection byproducts. Based on the available information, the issuance of the waiver will not protect a balanced and indigenous population of shellfish, fish, and wildlife. Therefore, the waiver should be denied.

EDC refers the reader to the attached *Evaluation of the District's Renewal Application for a modified NBPDES permit under Section 301(h) of the Clean Water Act by D. Craig Barilotti, Ph.D, Sea Foam Enterprises (Evaluation)*. Staff inserted additional responses to comments in the Evaluation, attached.

Staff Response. The results of extensive effluent, receiving water, and seafloor monitoring lead US EPA and Regional Board staff to conclude the discharge is not impairing the ocean's beneficial uses or its aquatic life populations. Staff concludes the monitoring results represent the long-term character of the ocean and seafloor. The results are not illusory. Ample documentation demonstrates the area's creeks discharge huge quantities of sediment into the ocean during the rainy season, far exceeding the 4,500 pounds or so per day from the plant. Seafloor monitoring indicates that the huge quantities of sediment discharged during the El Niño from area creeks may have reduced ecosystem health over the entire area. The Discharger's annual seafloor monitoring likely documents the ecosystem's increasing health as it overcomes the effects of the sediment discharged from land.

Staff disagrees that the current ITI result of 80 is a kind of "false positive" result. The ITI results from data obtained by annual benthic monitoring, and the year 2000 results are as valid as the 1992 through 1999 results EDC bases its claim of impairment upon.

See also **Modeling the Effect on Aquatic Life of Solids Discharged from the Plant**, beginning on page 6 of the Staff Report. The modeling confirmed the seafloor-monitoring program's results, estimating a continual solids concentration of about 0.1 ounce per square foot on the seafloor at the plant's design flowrate of 9.0 MGD. This contrasts with the statement that viruses concentrate on the seafloor. Staff disagrees with the statement that divers cause significant solids resuspension, although the actions of turbulent currents

near the seafloor are known to do so, and thereby remove solids from the seafloor. "Wave orbitals" may also resuspend solids.

7. Bacteria and viruses in the discharge impair recreational activities at Goleta Beach. Brown and Caldwell's 1987 study found the current trends onshore during times of minimal stratification. The current meters have not detected the waste field, indicating better current-monitoring methods should be used. EDC restates HTO's findings of viruses in the discharge, Goleta Beach, but not in Goleta Slough. EDC is concerned because the proposed Order allows the discharge of more than twice the secondary standard's solids limitation, thereby allowing more than twice the discharge of bacteria, which the solids mask from disinfection.

EDC agrees the law requires no monitoring for viruses. However, HTO and Channelkeeper believe the Board should require virus monitoring to better understand the impact of the discharge. Recreational activities are therefore impacted, and the Board should deny the waiver.

Staff Response. See Response to HTO comment #2.

8. The Board should deny the waiver because increased population growth will cause increased discharge of solids. The State Department of Housing and Community development mandates Santa Barbara County provide approximately 20,000 new housing units over the next ten years. Population growth may exceed the rates currently projected, added to if Hope Ranch converts from septic tank/leachfield systems to sewer.

Staff Response. The Discharger considered growth rate and its impact on wastewater flow rates and quality. The Discharger must provide adequate treatment to meet the Order's effluent limitations and avoid mandatory minimum penalties and/or enforcement action.

9. Even if 301(h) requirements can be met, a waiver is prohibited, because the waiver is inconsistent with the Coastal Zone Management Act.

Staff Response. The Coastal Commission will decide this issue.

10. Issuance of the waiver violates the State and federal antidegradation policies. The attached comment letter restates the State's

Antidegradation Policy, Board Resolution No. 68-16, and the federal Antidegradation Policy. The discharge is adversely affecting the surrounding ecosystem and recreation.

Staff Response. The quotations from the policies require discharges comply with waste discharge requirements and not impair the ocean's beneficial uses. The results of effluent, receiving water, surf-zone, and seafloor demonstrate the proposed modified permit has required, and continues to require, the Discharger to treat its wastewater to levels which protect the specified beneficial uses.

11. The Staff Report, proposed Order and Monitoring Program contain inaccuracies and discrepancies, which require correction.

Staff Response. Staff incorporated the suggested changes, where appropriate.

RECOMMENDATION: Adopt Waste Discharge Requirements Order No. RB3-2002-021, as proposed

ATTACHMENTS

1. Internal Memo, *Effluent Monitoring Results Compared to this Board's Monitoring Results.*
2. Draft Waste Discharge Requirements Order No. RB3-2002-0021
3. Monitoring and Reporting Program No. RB3-2002-0021
4. US EPA Tentative Decision Document.
5. *Evaluation of the District's Renewal Application for a modified NBPDES permit under Section 301(h) of the Clean Water Act* by D. Craig Barilotti, Ph.D, Sea Foam Enterprises (Sea Foam Report), with staff's responses.
6. Comment letters.

